Preosteoblast-enriched lnc-Evf2 facilitates osteogenic differentiation by targeting Notch

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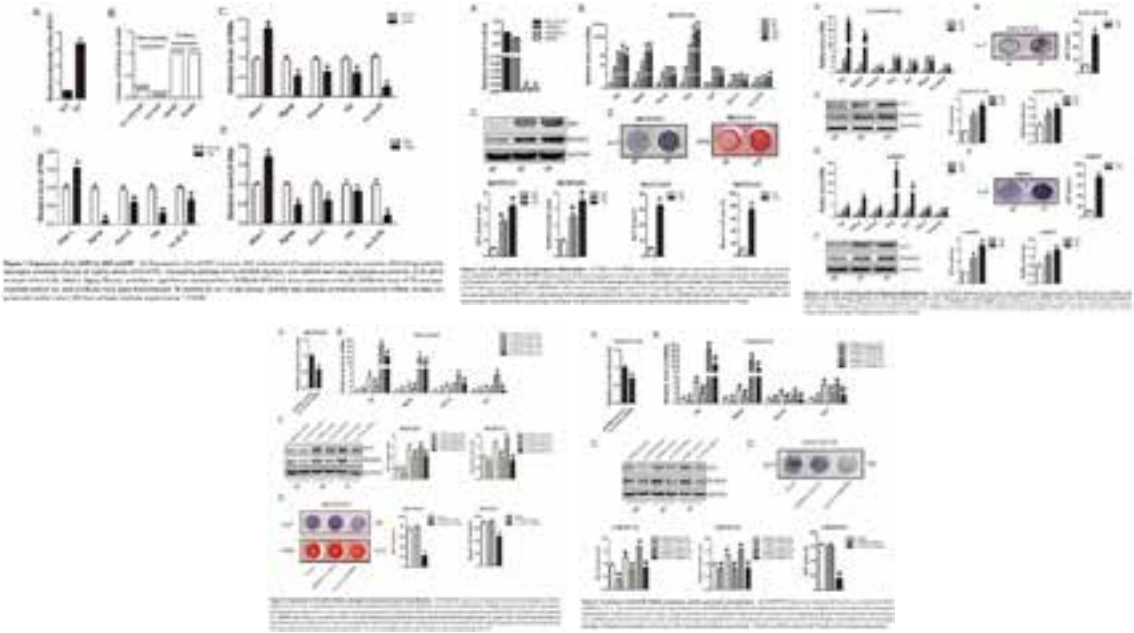
Ossification of ligaments (OL) and osteoporosis (OP) are multifactorial disorders without definitive clinical biomarkers. Long non-coding RNAs (lncRNAs) are known to involve in regulating pathogenesis. Here, we have identified a preosteoblast-enriched lnc-Evf2 that was overexpressed in ossified ligamentum flavum (OLF) and down-expressed in OP. lnc-Evf2 is gradually upregulated during osteogenic induction, correlating with the enhanced expression of osteogenic marker genes and matrix mineralization. Moreover, knockdown of lnc-Evf2 significantly inhibits the expression of osteogenic differentiation markers and delays the osteoblastic mineralization process, indicating that this molecule is involved in osteogenesis. Mechanistically, we demonstrated that silencing of lnc-Evf2 decreases the protein level but not the mRNA levels of Notch2, Notch3, and Hes1, all of which correlate with osteogenesis. Taken together, our data demonstrate that lnc-Evf2 promotes osteogenic differentiation and bone formation through the Notch signaling, revealing that lnc-Evf2 may serve as a novel potential clinical target of OL and OP.



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1. Harper Zhen Zhang, Haixia Q, Han Xia#, Qi Liu, Yi Ren, Kun Zhang, Yuan Xue, and Wei Hong1. Preosteoblast-enriched lnc-Evf2 facilitates osteogenic differentiation by targeting Notch. Acta *Biochim Biophys Sin* (Shanghai). 2021 Feb 4;53(2):179-188.
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5. Jiaming Zhou, et al. Clinical efficacy of calcitonin compared to diclofenac sodium in chronic nonspecific low back pain with type I Modic changes: a retrospective study. *J Pain Res*. 2018 Jul 17;11:1335-1342.

Biography

Han Xia has his expertise in evaluation and passion in improving the health and wellbeing. In the current study, he showed that lnc-Evf2 is a preosteoblast-enriched lncRNA that is overexpressed in OLF and during osteogenic differentiation, but was down-expressed in OP. Knockdown of lnc-Evf2 significantly inhibits the expression of osteogenic differentiation marker genes and the ALP activity and delays the osteoblastic mineralization process. Mechanistically, we demonstrated that silencing of lnc-Evf2 decreases the protein levels but not the mRNA levels of Notch2, Notch3, and Hes1 in preosteoblasts and mouse embryonic fibroblasts, suggesting that lnc-Evf2 promotes osteogenesis via the Notch signaling. focusing.

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